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Comments Regarding NJDEP's
White Papers in Support of
Proposals Affecting the SIP
Revision Process

New Jersey Department of Environmental Protection
Air Quality Planning
P.O. Box 418
401 E. State St.
Trenton, NJ 08625-0418

Dear Sir/Madam:

We wish to comment on several of the white papers completed as a result of work done by various work groups over the past year. The work groups worked hard to prioritize issues and to identify key sources for potential emission reductions. The white papers can serve as a foundation for future progress if the information contained in them is accurate and properly researched. Unfortunately, such is not the case for several of the white papers pertaining to processes in the refining industry.

SCS004B – Flares in a Petroleum Refinery

One example is white paper SCS004B regarding Petroleum Refinery Flares. The source of the emission data for VOC, SO₂ and NO_x is not given. We raised this issue during the meetings of the VOC workgroup. We asked for the source of the emission data for refinery flares because it appeared to be significantly overstated. No one seemed quite sure of the source of the data that was being used. The use of 2002 as a baseline year indicates that this data probably was generated from data used by EPA.

We believe that data from the state's Annual Emission Statement (AES) should be used as a basis for determining the baseline emissions. It should provide superior and more representative data. Comparing the emissions we reported for the base year of 2002 to the emissions presented in the white paper raises questions about the data. In particular, our VOC emissions were less than 5% of the total presented in the white paper. Our reported NO_x emissions were less than 9% of the emissions in the white paper. Since there are so few refineries in New Jersey and we are the largest we believe the emissions baseline used in the white paper is incorrect. We ask the Department to review the reported emissions of each refinery in NJ to document and verify the accuracy of the baseline emissions.

The recommended control measure listed in this white paper is a flare gas recovery system (FGRS). It is unclear but it appears that the author presumed that no refinery currently employs a FGRS. We believe that the vacuum line system employed by our refinery meets the definition of a FGRS found in the consent decree that was recently entered for our refinery. Both USEPA and NJDEP were signatories to that CD.

The method of calculating emission reductions is not presented and documented so it is impossible to comment on the soundness of the method. It appears that the author assumed that flaring would be reduced by 36% in the case of VOC's and NOx but only 31% in the case of SO2. We ask the Department to document its assumptions used in calculating the emission reductions it proposes.

The capital and operating costs presented in the white paper are not documented and appear to be low based upon our knowledge of other systems and the significantly higher cost of construction in New Jersey. We ask that the Department document the source of its capital and operating cost data and verify that it reflects the significantly higher construction costs found on the east coast relative to other parts of the country.

SCS004A – Process heaters and Boilers in a Petroleum Refinery

This white paper again fails to list or document the source of the baseline emissions for NOx used as its basis. We believe this number is not correct based upon the emissions we reported in our AES. Furthermore, the use of 2002 as a baseline year ignores the significant emission reduction made by refiners over the past 4 years. Much of this was driven by projects required to meet EPA's Clean Fuels requirements and consent decree required reductions. We ask the Department to review the reported emissions of each refinery in NJ to document and verify the accuracy of the baseline emissions. Without accurate emission data it is impossible to determine if further NOx reductions from refinery heaters and boilers is warranted.

Candidate Measure 1 correctly asserts that most units already employ Ultra Low NOx Burners (ULNB). However, it claims an incremental NOx reduction of 75-90% for replacing the remaining Low NOx burners in New Jersey with ULNB. We believe this incremental reduction from LNB to ULNB is overstated. We believe a 60%-75% reduction is more reflective of the reductions achievable by replacing LNB with ULNB. This measure also ignores the fact that most refiners will have to install ULNB to comply with consent decree requirements.

Candidate measure 2 would require Selective Catalytic Reduction on all heaters and boilers with a heat duty greater than 250 MMBtu/hr. While SCR is an effective NOx control technique for new heaters and boilers many problems can occur when trying to retrofit older units. This drives costs to much higher levels than the \$2000-\$5000 per ton of NOx removed reported in the white paper. The source of the control cost is also not documented but typical numbers reported by vendors or found in literature do not take into account the significantly higher east coast construction costs.

Nearly all refinery heaters and boilers greater than 250 MMBtu/hr are subject to the Department's NOx budget program. This cap and trade program is technology forcing in that it continues to ratchet down NOx allowances and thus acts to reduce NOx emissions. The NOx budget program has the effect of making facilities look at reducing emissions from high NOx emitting units. Mandating SCR on many units within the state could adversely affect the NOx budget program by flooding the market with NOx allowances and lowering their value. The lower value for NOx allowances could make certain NOx reducing projects less viable and prevent them from being done. Did the Department consider the effect of this proposed compliance measure on the NOx Budget Program?

Particulate emissions have sometimes increased from sources that have installed SCR. These are typically very fine emissions. The Department has not accounted for this PM emission increase associated with the recommended SCR strategy. In light of New Jersey's status as non-attainment for PM-2.5 we believe it is critical that the Department address this issue.

The calculations of NOx emission reductions are not shown. It is impossible to determine what reductions the Department believes will be achieved from the conversion of LNB to ULNB and what reductions will result from mandating SCR on large heaters and boilers. The total

calculated reduction is 573 tons but that represents only 19% of the total emissions. This indicates that NOx emissions from refinery heaters and boilers are already well controlled. Only with the expenditure of relatively large sums of money can we realize these relatively minor reductions in NOx emissions.

SC004C – Fluid Catalytic Cracking Unit (FCCU) and Fluidized Coking Unit (FCU) in Petroleum Refineries.

This white paper again fails to list or document the source of the baseline emissions used as its basis. We believe this emission data is not correct based upon the emissions we reported in our AES. Our reported VOC emissions were less than 9% of those shown in the white paper and our SO2 emissions were less than 2% of the emissions used as a basis for the white paper. Our NOx emissions were 62% of those used as a baseline in the white paper. Clearly something is not correct. Our VOC data was done by stack test and our SO2 and NOx emissions are measured with a CEMS so we have complete faith in our data. We ask the Department to document the source of their emission estimates. This is important because the accurate data may demonstrate that we are already doing a good job controlling these sources and that further controls may be unnecessary.

Here again, the use of 2002 data does not reflect changes already required by the consent decrees entered for the largest refiners in the state. Simply complying with NSPS Subpart J will reduce SO2 emissions to a level an order of magnitude less than what is being reported in the white paper. This will happen as a result of the various consent decrees. Further reductions from that level may not be cost effective.

A common thread for all of the proposed technologies is that no documentation is given as to how they would be applied. Thus it is impossible to verify the proposed emission reductions. It is clear that they would not be applied across the board because the math does not support that conclusion. We ask the Department to provide more detail and documentation as to how the proposed reductions were determined.

Candidate Measure 1 would require SCR to be installed on all FCC's in the state. During the consent decree process EPA strongly supported installing SCR on FCC's for NOx control. They believe them to be cost effective. However, they looked at each refinery on a case by case basis and determined that in some cases SNCR, NOx reducing additives and other technologies were more appropriate. We think the Department should be similarly flexible.

The white paper does not document the control cost it uses in the white paper. We believe that once again the Department has used vendor or literature values that tend to reflect idealized situations. We believe based on previous studies that retrofitting two large catalyst beds into an already cramped FCC operating area using the east coast construction cost figures would cost significantly more than the \$2500/ton figure given in the white paper. We ask the Department to document the source of this figure and adjust it for retrofit applications and the higher NJ construction costs.

Candidate Measure 2 would require the installation of LoTOx technology on all FCC's in the state. This is one of several scrubber based technologies available to reduce NOx emissions. Studies done for our refinery by the equipment vendor indicated that because of residence time issues a new scrubber would have to be built in series with our existing scrubber for the system to work. The new scrubber would have the same space and constructability issues as SCR and became prohibitively expensive. We believe the \$1700-\$2000 per ton on NOx removed was based upon vendor and literature values and does not reflect the difficulty of retrofit installations or the significantly higher cost of constructing in New Jersey. We ask the Department to document the source of this figure and adjust it for retrofit applications and the higher NJ construction costs.

One other problem that plagues all scrubber based NOx control schemes is that they convert an air pollutant into a water pollutant. Nitrates in the scrubber effluent could require significant wastewater treatment capital and/or operating costs in order to meet effluent limitations. These costs are almost never included in the control costs reported for LoTOx and other scrubber technologies. Yet they are certainly part of the package and must be addressed. Nitrates are also a TRI (and RPPR) chemical and a significant increase in nitrates in wastewater could trigger TRI reporting where none previously existed. Certainly this is the Department's decision but it appears that the Department is endorsing the conversion of NOx to a TRI reportable chemical as an effective air pollution control measure.

Candidate measure 3 would reduce SO2 emissions by a combination of DeSOx additives and improved scrubber performance. This might be a valid proposal if the Department's assumed emissions are correct. We believe that they are in error in the base case and that they do not consider consent decree mandated requirements. This is another example of the problems caused by selecting 2002 as a baseline year. If it is the position of the Department to take advantage of the CD based requirements and other significant emission reduction implemented over the past 4 years they should clearly indicate that in the white paper.

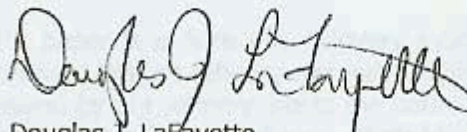
Candidate measure 4 would apparently impose process operating limits for FCC regenerators for VOC and CO control. It would also impose restrictions on feed quality to control the same pollutants. We believe that our refinery engineers and operators are more qualified to establish process operating conditions because of their vast hands experience with the equipment. We do not believe there is a link between feed quality and VOC/CO emissions for partial burn FCC's with CO Boilers. If the Department has documentation to the contrary we would like to see it.

The proposed reduction in VOC emissions is less than 15% of the VOC emissions the Department believes are being emitted. This leads to the conclusion that VOC and CO emissions are already well controlled in refinery FCC's.

We oppose any permit limits on operating parameters when CEMS and other surrogates exist to demonstrate continuous compliance with permit limits. Our experience is that even when it is agreed that a certain parameter can affect emissions the limit is set without regard to what the emissions effect is. Certain operating limits can effectively establish new emission limits that are lower than were established in the original permit. Also, assuming that these new operating limits would be monitored hourly they would represent over 17,500 potential points of potential permit violation. Is this a wise way to spend our resources when even the Department's estimated emissions reduction is a mere 20 tons?

Under the rationale for the recommended strategies the author states that under the current consent decrees refinery FCC's will have to achieve NOx emissions of 20 ppm and SOx emissions of 20 ppm. This is simply not true. Accepting a 20 ppm NOx limit is one option refineries can select to comply with the consent decree. DeNOx additives and SNCR projects have also been approved to comply with the CD with emissions limits to be established following demonstration projects. These limits will certainly be greater than 20 ppm. Most refineries have accepted 25 ppm SO2 limits as a result of the CD.

Very truly yours,



Douglas J. LaFayette
Senior Environmental Engineer